NOTICE!

ALL DRAWINGS ARE LOCATED AT THE END OF THE DOCUMENT

CORRES CONTROL
OUTGOING LTR NO

49651

DOE ORDER# 4700.1

95 RF 01288

DIST	LTR	ENC
AMARAL M E		
BURLINGAME A H		
BUSBY W S		
BRANCH D B		
CARNIVAL G J		
DAVIS J G		
FERRERA D W		
FRAY R E		
GEIS J A		
GLOVER W S		
GOLAN P M		
HANNI B J		
HARMAN L K		
HEALY T J		
HEDAHL T		
HILBIG J G		
HUTCHINS N M		
JACKSON D T		
KELL R E		
KUESTER A W		
MARX G E		
McDONALD M M		
McKENNA F G		
MONTROSE J K		
MORGAN R V		
POTTER G L		
PIZZUTO V M		
RISING T L		
SANDLIN N B		
SCHWARTZ J K		
SETLOCK G H		
STEWART D L		
STIGER S G		
TOBIN P M		
VOORHEIS G M		
WILSON J M		
C.A. BICHER	✓	✓
E.G. MAST	✓	✓
M.R. WOOD	✓	✓
CORRES CONTROL	X	X
ADMN RECORD/080	✓	✓
TRAFFIC		
PATS/T130G		

CLASSIFICATION

UCNI		
UNCLASSIFIED	✓	
CONFIDENTIAL		
SECRET		

AUTHORIZED CLASSIFIER
OCUMENT CLASSIFICATION
REVIEW WAIVER PER
CLASSIFICATION OFFICE
DATE

IN REPLY TO RFP CC NO
N/A

ACTION ITEM STATUS
PARTIAL/OPEN
CLOSED N/A

TR APPROVALS

RIG & TYPIST INITIALS
CAB/cb

EG&G ROCKY FLATS

EG&G ROCKY FLATS, INC
ROCKY FLATS PLANT, P O BOX 464 GOLDEN COLORADO 80402 0464 (303) 966 7000

January 31, 1995

95-RF-01288

Kurt Muenchow
Environmental Restoration Division
DOE, RFFO

OPERABLE UNIT 5, WOMAN CREEK PRIORITY DRAINAGE IHSS 209 SURFACE SOIL EVALUATION - CAB-012-95

Action Transmit the attached soil sampling plan for the IHSS 209 surface soil evaluation to the Environmental Protection Agency (EPA) and the Colorado Department of Public Health and Environment (CDPHE) for information purposes

This letter transmits the soil sampling plan for the IHSS 209 Surface Soil Evaluation per Technical Memorandum 15 (TM 15), Addendum to the Field Sampling Plan for transmittal to the EPA and the CDPHE

Attached is a copy of the soil sampling plan which is based on the High Purity Geranium (HPGe) survey results and the results of the subsequent FIDLER surveys

The surface soil sampling will start the week of January 31, 1995, weather permitting This activity is now 32 days behind on the critical path schedule for the IAG milestones associated with the RFI/RI Report Sample Management has been notified that the lab analysis must be expedited

If I can provide any additional information, please call me at 966-9100

CAB

Carol A Bicher
Operable Unit No 5 Closure
Environmental Restoration Program Division

CAB cb

Orig and 1 cc - K Muenchow

Attachment
As Stated

ADMIN RECORD

A-0005-000684

SUMMARY OF RESULTS OF RADIOLOGICAL SURVEYS AND FIELD SAMPLING PLAN FOR COLLECTION OF SURFACE-SOIL SAMPLES - IHSS 209 AND OTHER SURFACE DISTURBANCES, OPERABLE UNIT NO 5 ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

1 0 INTRODUCTION

The purpose of this report is summarize the results of surface radiological surveys of portions of IHSS 209, the Surface Disturbance West of IHSS 209, and the Surface Disturbance South of the Ash Pits and to describe plans for the collection of surface soil samples to further investigate potential contamination at these sites These activities are being conducted in accordance with Technical Memorandum (TM) No 15 for Operable Unit No 5 (OU5) (DOE, 1994) Section 2 0 of this report describes the performance and results of the surface radiological surveys, and Section 3 0 provides a Field Sampling Plan (FSP) for the collection of surface soil samples

2 0 SURFACE RADIOLOGICAL SURVEYS

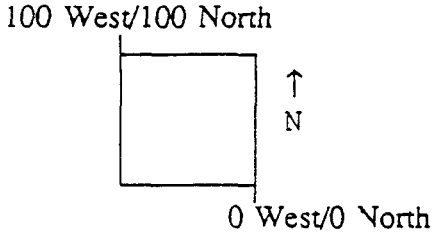
As specified in TM15, surface radiological surveys of IHSS 209 and the other surface disturbances were performed to further investigate radiological contamination indicated by the results of analysis of surface-soil samples collected during previous OU5 RFI/RI investigations (DOE, 1994) EG&G Rocky Flats, Inc 's Gamma Survey Group (GSG) performed surface radiological surveys using a High Purity Germanium (HPGe) detector over the areas identified on Figures 1 and 2 The GSG utilized an array of 6 HPGe detectors mounted to a telescoping mast attached to a vehicle These surveys were conducted using a 150-foot grid spacing as shown on Figures 1 and 2, a detector height of 6 5 meters, and a counting time of 1 hour As described in TM15, the primary radionuclides of interest at these locations are plutonium-239/240 and americium-241 Plutonium-239/240 activities are not measured directly by this system but can be calculated from the activities of daughter products With the detector height and counting time specified above, the minimum detectable activity (MDA) for americium-241 is 0 1 pCi/g The following assumptions were used when calculating the results of the survey

- Soil density = 1 5 g/cm^3
- Soil moisture = 10%
- Vertical distribution = homogeneous
- Averaging depth = 3 0 cm
- Air density = 0 001293 g/cm^3

Table 1 lists the results obtained from the HPGe survey of IHSS 209, the Surface Disturbance West of IHSS 209, and the Surface Disturbance South of the Ash Pits The activities of each radionuclide at each survey station (see Figures 1 and 2 for station locations) and the coordinates of each station determined with a global positioning system (GPS) are given on this table Any detectable activity of americium-241 or plutonium-239/240 is considered to be anomalous As shown on Table 1, americium-241 was detected at activities ranging from 0 1 to 0 5 pCi/G at a total of 24 locations in IHSS 209 and the surface disturbances Plutonium-239/240 was not

detected at any locations The activities of the other radionuclides listed on Table 1 were determined to be at background levels by the GSG

Since the HPGe system calculates the activity at each location as a distributed source, there is the possibility that a point source caused the americium-241 anomalies identified Therefore, additional radiological surveys with a Field Instrument for the Detection of Low-Energy Radiation (FIDLER) were conducted at each of the 24 locations where americium-241 was detected by the HPGe survey The FIDLER surveys were conducted by establishing a 100-ft^2 grid centered on each HPGe station Each 100-ft^2 grid was then surveyed on lines spaced 4-feet apart Any readings obtained with the FIDLER that exceeded background levels were marked in the field with stakes and labeled with the HPGe station number followed by a letter designation assigned sequentially to each anomaly identified For example, the first anomaly identified by the FIDLER survey at HPGe station K-56 was labelled K-56A In addition, each anomaly was identified by its coordinates within the 100-ft^2 grid as shown below



Anomalies identified by the FIDLER survey were further investigated with other radiation detection instruments in an attempt to identify the source(s) of the anomalies Anomalous readings with the FIDLER were detected at five HPGe stations in IHSS 209 and one station in the Surface Disturbance South of the Ash Pits These anomalies are discussed below In all cases, the activities detected were only slightly above background and no evidence of the source of the detected radiation (e g , surface debris) was found

IHSS 209

K-56 K-56A (25 West/4 North), approximately 46 ft south of HPGe station K-56, was frisked with a Bicron B-50 beta/gamma probe with net readings of 66cpm, 35cpm, 70cpm, and 61cpm

K-57 K-57A (10 West/90 North), approximatelv 60 ft northeast of HPGe station K-57, showed FIDLER counts of 350 cpm above background

L-55 L-55A (0 West/100 North), located at the NNE corner of L-55 grid, showed elevated FIDLER counts of 500-600 cpm above background

H-60 following are anomaly coordinates with counts above background

(0 West/10 North) 600cpm	(8 West/65 North) 750cpm
(16 West/60 North) 600cpm	(28 West/55 North) 600cpm
(28 West/96 North) 650cpm	(36 West/25 North) 625cpm

I-62 following are anomaly coordinates with counts above background
(100 West/50-100 North) 350cpm (92 West/50 North) 600cpm
(66 West/30 North) 600cpm

Surface Disturbance South of the Ash Pits

M-14 M-14A (90 West/90 North), located approximately 70 ft northwest of HPGe station M-14, showed elevated FIDLER counts of approximately 750 cpm above background

3 0 SURFACE-SOIL SAMPLING PLAN

As specified in TM15 (DOE, 1994), surface-soil samples are to be collected from each anomaly identified by the FIDLER surveys A total of eight surface-soil samples will be collected at IHSS 209, the Surface Disturbance West of IHSS 209, and the Surface Disturbance South of the Ash Pits (Table 2)

A total of six samples will be collected from the five anomalies within IHSS 209 (Figure 1) One sample each will be collected at anomalies K-56A and L-55A Two samples each will be collected from the anomalies identified at stations H-60 and I-62 The relatively low activities detected with the FIDLER at the latter two stations do not warrant the collection of surface-soil samples at the location of each anomaly Therefore, one sample will be collected at the two anomalies with the greatest number of counts At station H-60 one sample be collected at coordinates 8 West/65 North and one will be collected at coordinates 28 West/96 North Similarly, one sample will be collected from the two anomalies with the greatest number of counts at station I-62 (coordinates 92 West/50 North and 66 West/30 North) Due to the relatively low activities detected with the FIDLER at anomaly K-57A, the collection of surface-soil samples at this location is not warranted

One sample will be collected from anomaly M-14A at the Surface Disturbance South of the Ash Pits (Figure 2) As discussed in TM15, a relatively high activity of plutonium-239/240 was detected in a surface soil sample collected from the Surface Disturbance West of IHSS 209 (sample SS50075AS) The plutonium-239/240 activity detected at this location was the primary reason that additional radiological surveys and surface-soil sampling was necessary at these sites Although, the HPGe survey did not detect americium-241 and plutonium-239/240 in the vicinity of this location, an additional surface soil sample will be collected at this location (Figure 1) as a verification and quality-control check

All of the samples to be collected from IHSS 209 and the other surface disturbances will be collected using the Rocky Flats (RF) method as outlined in SOP GT 8, Surface Soil Sampling The samples will be submitted to a laboratory for analysis of plutonium-239/240 and americium-241 One duplicate and one rinsate sample will also be collected and analyzed for the same parameters

4 0 REFERENCES

DOE, 1994 *Technical Memorandum No 15, Amended Field Sampling Plan, Operable Unit No 5, Rocky Flats Plant*, U S Department of Energy, Golden, Colorado, August

TABLE 1 - HPGe SURVEY RESULTS

Station	North	East	K 40	Ra 226	Th-232	U 238	U 235	Cs 137	Am 241	Pu 239
	feet	feet	pCi/g	pCi/g	pCi/g	pCi/g	pCi/g	pCi/g	pCi/g	nCi/g
I59	746965	2087145	8 2	0 66	0 69	1 3	0 04	0 32	0 0	0 0
J59	746815	2087145	9 4	0 73	0 82	1.3	0 05	0 19	0 0	0 0
K59	746665	2087145	9 9	0 70	0 80	1 6	0 05	0 13	0 0	0 0
L45	746515	2085045	8 6	0 58	0 91	1 2	0 06	0 62	0 0	0 0
K45	746665	2085045	9 5	0 68	1 02	1 4	0 08	0 64	0 0	0 0
J45	746815	2085045	8 9	0 66	1 00	1 4	0 07	0 64	0 1	0 0
I45	746965	2085045	10 4	0 77	1 23	2 1	0 08	0 55	0 0	0 0
L46	746515	2085195	7 2	0 59	0 72	1 0	0 05	0 61	0 0	0 0
L47	746515	2085345	8 8	0 73	0 98	1 4	0 06	0 61	0 0	0 0
L48	746515	2085495	10 0	0 88	1 21	1 5	0 07	0 60	0 1	0 0
K46	746665	2085195	9 0	0 74	0 94	1.3	0 05	0 61	0 0	0 0
J46	746815	2085195	9 5	0 84	0 93	1 6	0 07	0 59	0 0	0 0
I46	746965	2085195	10 3	0 89	1 03	1 8	0 07	0 60	0 0	0 0
K47	746665	2085345	8 4	0 75	0 81	1 2	0 06	0 52	0 0	0 0
J47	746815	2085345	8 9	0.85	0 89	1 6	0 08	0 47	0 0	0 0
I47	746965	2085345	9 7	0 83	0 85	1 6	0 08	0 60	0 0	0 0
K48	746665	2085495	9 1	1 21	1 01	1 6	0 05	0 51	0 0	0 0
J48	746815	2085495	9 2	1 28	0 94	1 5	0 06	0 52	0 0	0 0
I48	746965	2085495	9 0	1 28	0 95	1 7	0 05	0 52	0 0	0 0
L49	746515	2085645	11 1	0 91	1 36	1 6	0 07	0 51	0 2	0 0
K49	746665	2085645	9 4	0 88	1 11	1 5	0 08	0 38	0 0	0 0
J49	746815	2085645	9 4	0 96	0 99	1 3	0 06	0.37	0 0	0 0
I49	746965	2085645	9 8	0 98	0 97	1 4	0 07	0 34	0 0	0 0
K56	746665	2086695	9 5	1 07	0 98	1 4	0 03	0.31	0 2	0 0
H60	747115	2087295	9 6	0 76	0 95	1 9	0 06	0 43	0 3	0 0
H61	747115	2087445	9 1	0 91	0 90	1 8	0 03	0 49	0 4	0 0
H59	747115	2087145	8 9	0 94	0 81	1 7	0 05	0 41	0 3	0 0
I58	746965	2086995	9 9	1 04	1 04	2 0	0 06	0 41	0 2	0 0
J58	746815	2086995	9 0	1 00	0 95	1 8	0 04	0 42	0 2	0 0
J57	746815	2086845	10 0	0 94	1 00	1 8	0 05	0 43	0 3	0 0
I62	746965	2087595	11 2	0 96	1 09	1 7	0 05	0 35	0 3	0 0
I61	746965	2087445	11 0	1 05	1 06	1 6	0 04	0 48	0 2	0 0
J61	746815	2087445	13 0	1 16	1 17	2 0	0 05	0 60	0 3	0 0
L59	746515	2087145	8 9	1 02	0 87	1 7	0 03	0 42	0 2	0 0
L58	746515	2086995	9 5	1 05	0 88	1 6	0 03	0 31	0 1	0 0
M57	746365	2086845	9 6	1 22	1 01	1 7	0 04	0 47	0 0	0 0
L55	746515	2086545	8 7	0 70	0 85	1 2	0 05	0 38	0 2	0 0
M55	746365	2086545	9 7	0 73	0 78	1 5	0 06	0 13	0 0	0 0
M54	746365	2086395	9 0	0 79	0 77	1 6	0 04	0 39	0 0	0 0
N55	746215	2086545	9 3	0 80	0 89	1 4	0 06	0 42	0 0	0 0
L56	746515	2086695	9 1	0 69	0 85	1 7	0 06	0 10	0 0	0 0
I60	746965	2087295	8 4	0 80	0 75	1 0	0 04	0 38	0 2	0 0
J60	746815	2087295	9 6	0 80	0 79	1 3	0 03	0 35	0 0	0 0
K60	746665	2087295	9 4	0 80	0 79	1 5	0 04	0 36	0 2	0 0
K58	746665	2086995	8 3	0 58	0 67	1 2	0 04	0 15	0 0	0 0
L57	746515	2086845	9 6	0 57	0 80	1 1	0 04	0 17	0 0	0 0
M56	746365	2086695	9 1	0 60	0 79	1 4	0 05	0 17	0 0	0 0

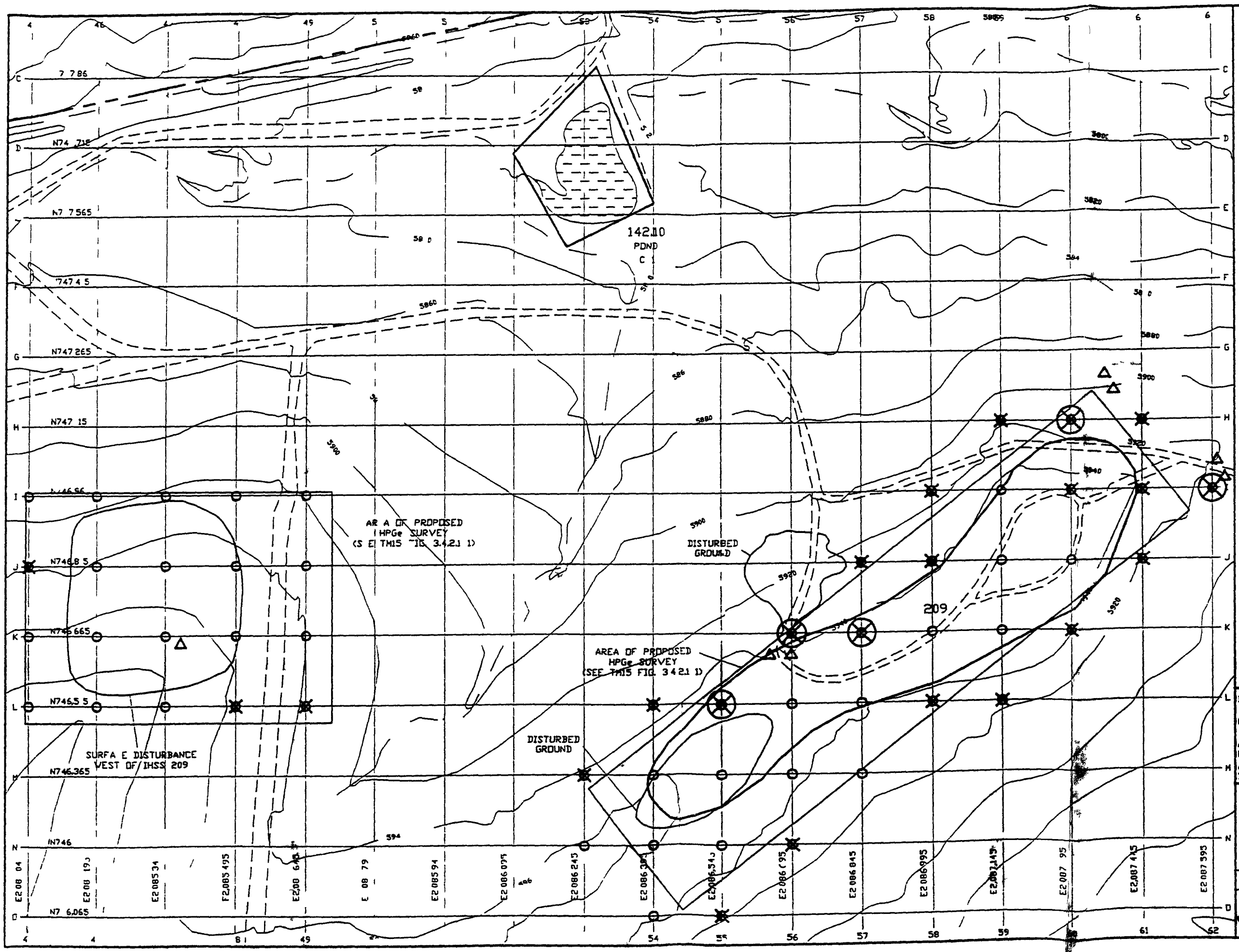
TABLE 1 (Cont.) - HPGe SURVEY RESULTS

Station	North	East	K-40	Ra 226	Th-232	U-238	U 235	Cs-137	Am-241	Pu 239
	feet	feet	pCi/g	pCi/g	pCi/g	pCi/g	pCi/g	pCi/g	pCi/g	nCi/g
N56	746215	2086695	8 4	0 76	0 86	1 6	0 05	0 43	0 1	0 0
K57	746665	2086845	8 8	0 54	0 82	1 6	0 06	0 32	0 1	0 0
M33	746365	2086245	6 9	0 58	0 78	1 6	0 06	0 63	0 3	0 0
L54	746515	2086395	9 0	0 69	1 01	1 5	0 08	0 63	0 3	0 0
N53	746215	2086245	6 3	0 46	0 60	1 4	0 04	0 39	0 0	0 0
L54	746515	2086395	9 0	0 69	1 09	1 6	0 07	0 56	0 2	0 0
N54	746215	2086395	9 0	0 62	0 77	1 1	0 06	0 43	0 0	0 0
O55	746065	2086545	9 8	0 82	1 05	1 4	0 07	0 47	0 2	0 0
N12	746215	2079995	6 2	0 56	0 83	1 3	0 07	0 43	0 0	0 0
O12	746065	2079995	10 3	0 83	1 44	1 6	0 09	0 44	0 0	0 0
N13	746215	2080145	5 0	0 72	0 84	1 7	0 06	0 52	0 0	0 0
N14	746215	2080295	6 3	0 68	0 92	1 6	0 06	0 40	0 0	0 0
M15	746365	2080445	5 3	0 58	0 73	1 0	0 05	0 32	0 0	0 0
N15	746215	2080445	11 3	0 98	1 55	1 8	0 09	0 40	0 0	0 0
M16	746365	2080595	12 4	0 88	1 43	2 3	0 09	0 37	0 0	0 0
L16	746515	2080595	10 6	0 81	1 24	1 5	0 07	0 39	0 0	0 0
L15	746515	2080445	9 3	0 83	1 11	1 6	0 08	0 41	0 0	0 0
K15	746665	2080445	9 6	0 81	1 18	1 4	0 07	0 35	0 0	0 0
L14	746515	2080295	11 2	0 82	1 37	1 6	0 09	0 37	0 0	0 0
M14	746365	2080295	4 9	0 52	0 69	1 4	0 04	0 38	0 1	0 0
M13	746365	2080145	10 8	0 73	1 27	1 4	0 09	0 36	0 0	0 0
N11	746215	2079845	9 8	0 73	1 18	1 4	0 08	0 35	0 0	0 0
M12	746365	2079995	11 1	0 80	1 31	1 7	0 07	0 39	0 0	0 0
O13	746065	2080145	10 0	0 91	1 45	1 5	0 08	0 44	0 0	0 0
O14	746065	2080295	9 1	0 78	1 15	1 9	0 08	0 43	0 0	0 0
N16	746215	2080595	9 6	0 85	1 30	2 0	0 07	0 45	0 0	0 0
L13	746515	2080145	10 9	0 86	1 33	1 7	0 07	0 39	0 0	0 0

TABLE 2 - SURFACE-SOIL SAMPLING LOCATIONS

Site	HPGe Station	Sample Coordinates*
IHSS 209	K-56	25West/4 North
IHSS 209	L-55	10 West/90 North
IHSS 209	H-60	8 West/65 North
IHSS 209	H-60	28 West/96 North
IHSS 209	I-62	92 West/50 North
IHSS 209	I-62	66 West/30 North
Surface Dist West of IHSS 209	N/A	746,655N/2,085,389E
Surface Dist South of Ash Pits	M-14	90 West/90 West

* With the exception of the one sample to be collected within the Surface Disturbance West of IHSS 209, the sample coordinates given are relative to the grid established for the performance of FIDLER surveys, as described in Section 2 0 The coordinates given for the sample to be collected within the Surface Disturbance West of IHSS 209 are the Colorado State Plane coordinates of sample SS50075AS



MAP LEGEND

- STREAMS, DITCHES, DRAINAGE FEATURES
- DIRT ROADS
- 209 — INDIVIDUAL HAZARDOUS SUBSTANCE SITES (IHSS)
- HPGe STATION
- HPGe SURVEY LOCATION WITH DETECTABLE AM 241
- FIDLER SURVEY LOCATIONS WITH ACTIVITY > BACKGROUND
- APPROXIMATE SURFACE SOIL SAMPLE LOCATION
- GRID FOR HPGe SURVEY

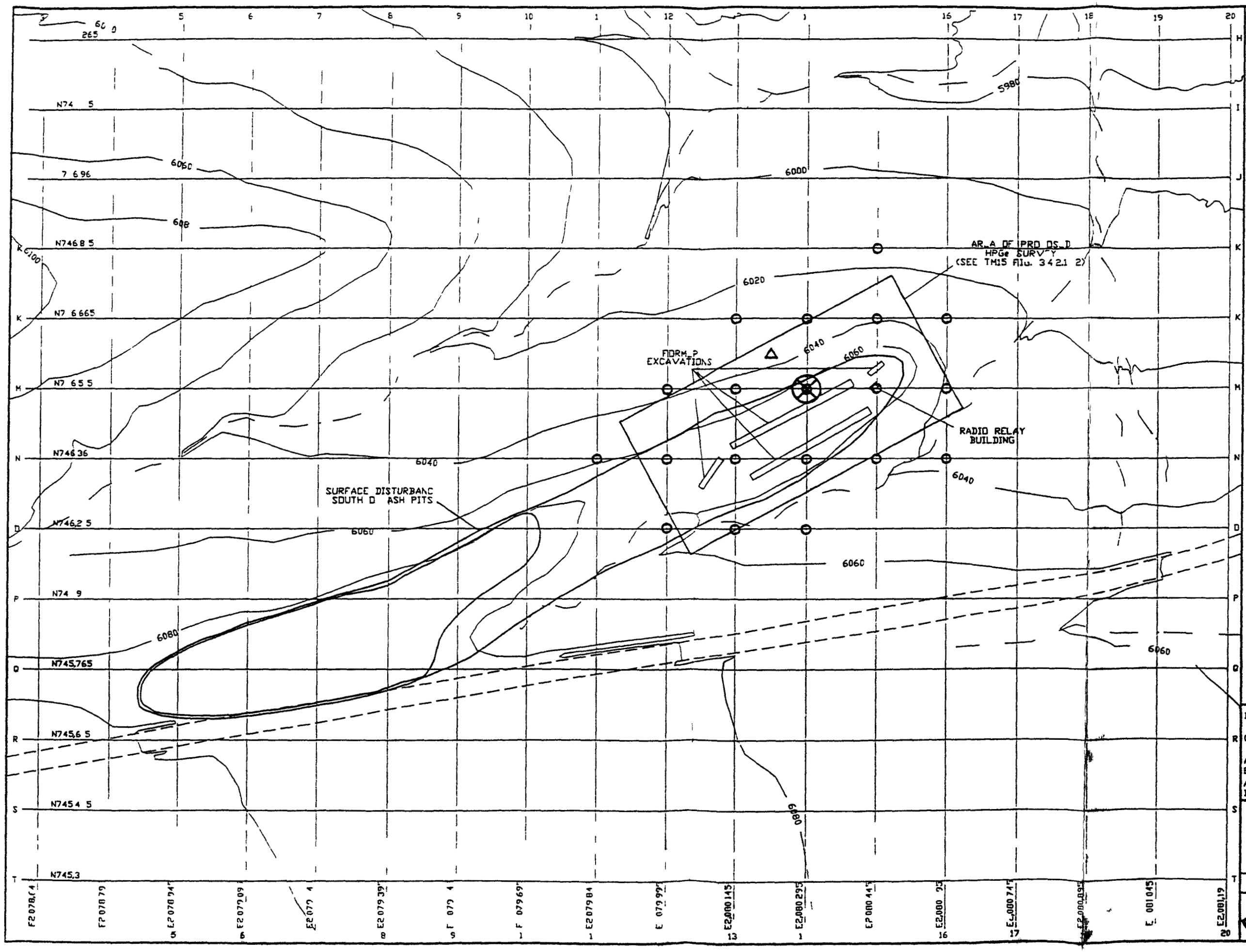
Drawn	AM	1-27-95
Checked		2/1/95
Approved EG&G		Date
Approved DOE		Date

HPGe AND FIDLER SURVEY LOCATIONS IHSS 209 AND SURFACE DISTURBANCE WEST OF IHSS 209

OU5 PHASE 1 RFI/RI IMPLEMENTATION

EG&G

FIGURE 1



MAP LEGEND

- STREAMS, DITCHES, DRAINAGE FEATURES
- DIRT ROADS
- 209 — INDIVIDUAL HAZARDOUS SUBSTANCE SITES (IHSS)
- HPGe STATION
- HPGe SURVEY LOCATION WITH DETECTABLE AM 241
- FIDLER SURVEY LOCATIONS WITH ACTIVITY > BACKGROUND
- APPROXIMATE SURFACE SOIL SAMPLE LOCATION
- GRID FOR HPGe SURVEY

0 100 200

SCALE 1 = 200

Drn	NM	1-27-95 Dat
Check d	JEF	1/27/95 Date
Appro d EG&G		Da
Appro d DOE		Dat

HPGe AND FIDLER SURVEY LOCATIONS SURFACE DISTURBANCE SOUTH OF THE ASH PITS

OU5 PHASE I RFI/RI IMPLEMENTATION

EG&G

FIGURE 2